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APPLICATION FOR UNITED STATES LETTERS PATENT

VOICE AVATARS FOR WIRELESS MULTIUSER ENTERTAINMENT SERVICES

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BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a voice avatar module for applying voice modification technologies to voice-based communication between wireless communication devices for wireless multiuser entertainment services on the Internet.

2. Description of the Related Art

In general, an avatar is an electronic representation of a person in a virtual reality space. Users of the Internet "wear" avatars to visit and explore different virtual reality spaces. The users control the motion and behavior of the avatar in the virtual reality space, meet other avatars, and communicate with the other avatars. There are many sites on the internet which comprise virtual reality spaces. These sites typically offer a selection of standard avatars. Other sites are dedicated to the development of avatars which allow users to create a new avatar according to the user's specification.

Avatars are driven, i.e., controlled, by a user. They can articulate speech, express emotions, demonstrate gestures, and/or move around in virtual reality space. Traditional virtual reality avatars are designed for viewing on screen devices with rich graphic capabilities which are not typically available for wireless devices. Accordingly, traditional avatars cannot be downloaded to a wireless client device.

Internet entertainment services typically provide two ways of user communication, i.e., text-based and voice-based. Text-based communication is the traditional

and widely accepted communication method used in Internet chat rooms. Voice-based communication is a more natural way to communicate for most people.

It looks promising to bring the avatar concept to voice-based communication on the Internet by introducing voice avatars that mask a user's original voice. Even more beneficial is the use of such avatars in pocket-size wireless devices, since the majority of these devices are voice-centric.

SUMMARY OF THE INVENTION

It is an object of the present invention to implement voice avatars for Internet multiuser entertainment services, especially wireless services.

As used herein, a voice avatar is a software program which implements some voice modification technique. A wide selection of voice modification technologies and products are available for commercial use. These technologies include transforming a person's voice to another voice, morphing a person's voice with a sound to produce an intermediate sound, and applying special effects, such as reverberation. The software program works like a voice signal filter which transforms a user's digitally encoded voice. The program may use data files holding parameters of a voice transformation algorithm so that the same program may be used for many avatars. The voice avatars may comprise software components with standard interfaces which may be plugged into any Internet service supporting it.

The voice avatars of the present invention may be used with voice-based Internet entertainment services that allow voice-based communication between participants such as, for example, chats and multiplayer games. According to the present invention, a voice avatar module for implementing the voice modification may be arranged in a user's mobile terminal, i.e., client-side avatars, or the voice avatar module may be arranged in a server connected to a network such as the internet, i.e., server-based avatars. In the server-based avatars embodiment, user registration records on the server associates a user with an avatar. The user registration record may contain the avatar itself, the location of the avatar in a memory in the server, or a link to the voice avatar that the user has selected. Then the voice communication

channel that the user is using will filter sounds coming through that voice avatar at the server and distribute it to all listening parties. In this embodiment, sound filtering occurs at the server. In the client-based avatar embodiment, the sound filtering occurs at the user's mobile terminal. The user may download a voice avatar to the wireless mobile terminal from another server or create a voice avatar at the wireless mobile terminal and store the voice avatar at the wireless mobile terminal.

Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Fig. 1 is a block diagram of a voice avatatar module;

Fig. 2 is a block diagram showing a client-side embodiment of the present invention;

Fig. 2a is a display of the mobile terminal of Fig. 2 during use according to the present invention;

Fig. 3 is a block diagram showing a server-side embodiment of the present invention; and

Fig. 4 is a block diagram showing a further server-side embodiment of the present invention.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

Fig. 1 shows a simple block diagram of a voice transformation module 100 which applies a voice modification to an input voice received from an input voice channel 110 and outputs an output voice on an output voice channel 120. The module works like a voice signal filter which modifies the input voice 110 in a desired way. A wide selection of voice modification technologies and products are available for commercial use. These technologies include transforming a person's voice into another voice, morphing a person's voice with a sound to produce an intermediate sound, and applying a special sound effect such as reverberation. The voice avatar module comprises a software program which implements one or more of these voice modification techniques on a digitally encoded input voice. The program may use data files holding parameters of a voice transforming algorithm so that the same program may be used for implementing multiple avatars which differ by parameter settings.

The creation of voice avatars requires specific knowledge of sound modification technologies. The change implemented by the voice avatar preferably makes the original voice unrecognizable from the output voice. However, the output voice should remain emotionally expressive and the speech should be understandable.

Fig. 2 shows a client-side implementation of the present invention in which the voice avatar module 100 is arranged in a wireless mobile terminal 200. The wireless mobile terminal 200 comprises any mobile electronic device that allows wireless communication via a wireless network such as, for example, a mobile phone, a Personal Digital Assistant (PDA),

and a laptop or notebook computer having a wireless modem. The voice avatar module 100 is shown in an enlarged block in Fig. 2 to show that the voice avatar module includes a memory 130. Two entertainment services that allow voice-based communication between users include a voice chat service 210 and a game service 220. The user mobile terminal 200 may connect to either of these services 210, 220 via a wireless network 300 which may include the Internet and the voice-based communication may use Voice-over-Internet-Protocol (VoIP) protocols. To use a voice avatar according to this embodiment, the user of terminal 200 first selects a desired voice avatar using the input keys 202 on the wireless mobile terminal 200 before connecting with a service. The selection of a voice avatar may comprise selecting a voice avatar from a list of voice avatars in a memory 130. Although the memory 130 is shown as being a dedicated part of the voice avatar module 100, the memory 130 may also be a general memory of the wireless mobile terminal 200. After selecting a voice avatar, the user may sample the output voice. If the user does not want to enable the selected voice, the user may select another voice avatar from the memory 130 until a suitable voice avatar is found. Once a suitable voice avatar is found, the user enables the voice avatar, and the user's voice will be transformed by the selected voice avatar until the user disables it. Once a voice avatar is selected, the user may enter any service which uses voice-based communication, such as the voice chat service 210 or a game service 220. Once the user enters a service, a display 204 on the wireless mobile terminal 200 may list the current service participants which indicates which of the participants are currently using a voice avatar. The indication may comprise the display of a special character such as a '(' before the name (or nickname) of the participant (see Fig.

2a). The display 204 may also indicate the current speaker with a special symbol. For example, Fig. 2a indicates that Tom is the current speaker with an arrow.

Instead of using voice avatars available in the memory 130 of the user's mobile terminal 200, the user may connect to a voice avatar site 400 and select one of the many voice avatars stored in the voice avatar site 400. Once the user has selected a voice avatar, the user can sample the voice avatar, download the voice avatar to the users voice avatar module 100 and save the selected voice avatar to the memory 130. Furthermore, the user may simply save the link for the selected avatar for later use. The link can be a Uniform Resource Locator (URL) of the avatar in the Internet.

Fig. 3 discloses a server-side embodiment of the present invention in which a voice avatar server 500 includes a voice avatar module 600 with its own selection of voice avatars. In this embodiment, the voice avatars to choose from are stored in a voice avatar section 532 of a memory 530. In this embodiment, the user of the wireless mobile terminal first connects to the voice avatar server 500. Once connected, the user selects from the list of available avatars in the memory 530. The selected voice avatar is then used by the voice avatar module 600 for transforming user's voice when the user communicates via voice communication while connected to any entertainment service such as the entertainment services 210, 220.

The memory 530 also includes user records 534 for all the users registered at the avatar server 500. A user record contains associations of voice avatars 532 with the entertainment services 210, 220. A new association is created when a user connects to a

service for the first time. After the user has selected an avatar for this service, the user is associated with that avatar until the user selects another voice avatar. Accordingly, when the user reconnects with the service at a later date, the user begins voice communication with the previous selected voice avatar as the association indicates. Thereby, the user may associate different avatars with different services and store the associations in the user record 534 at the avatar server 500.

Instead of choosing from voice avatars in the memory 530, the voice avatar server 500 may connect with a voice avatar site 400. The wireless mobile terminal 200 may contact the avatar site 400 directly for selecting from a list of voice avatars. In this case, when the voice avatar is selected, the user may sample the selected avatar and/or download the selected avatar to the voice avatars section 532 of the avatar site 500. Alternatively, the user may save the link (i.e., URL) for the selected avatar to his user record 534.

Fig. 4 shows yet another embodiment in which the voice avatar module 500 is arranged in an entertainment server 700 that allows voice based communication such as a voice chat service. In this embodiment, the user selects a voice avatar for use with the service provided by the entertainment server 700. As described above, the user may select a voice avatar from a voice avatar section 732 in a memory 730. Furthermore, a user record 734 associates the user with a voice avatar so that the user assumes the associated voice avatar when reconnecting to the entertainment server 700. Furthermore, a voice avatar site 400 may be contacted so that a user may select a further voice avatar which may be saved to the voice

avatar section 732 of the memory 730. Alternatively, the user may save the link for the selected avatar to his user record 734.

Thus, while there have shown and described and pointed out fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.